

IN THE CLAIMS:

Claims 1-29 were canceled by the Preliminary Amendment filed July 14, 2000.

Kindly amend the claims 30-44, as follows:

- 1 30. (Currently amended) A router for use in routing packets over a network, the
2 router supporting a plurality, X, of classes of service and including:
3 A. a plurality of input ports for receiving packets over the network;
4 B. a plurality of output ports for transferring packets over the network;
5 C. a classifier for assigning packets received by the input ports to X * Y classes
6 of service, where * represents multiplication, and mapping the XY classes of service to
7 the X classes of service that are supported by the router, the classifier assigning to the
8 packet one of Y associated levels of priority, wherein each level of priority is associated
9 with a different probability of packet loss;
10 D. a buffer subsystem for retaining the packets in class of service per output port
11 queues based on probabilities of discard associated with the X * Y classes of service; and
12 E. a scheduler for transferring the packets from the buffer subsystem through
13 each of the output ports based on the X classes of service.
- 1 31. (Original) The router of claim 30 wherein the buffer subsystem includes mul-
2 tiple storage locations and links available storage locations in a free queue.
- 1 32. (Original) The router of claim 31 wherein the buffer subsystem includes a
2 processor that determines:
3 i. a new weighted average depth for the free queue, and

4 ii. a probability of discard for a given packet if the new weighted average queue
5 depth falls below a predetermined maximum threshold associated with the class of serv-
6 ice to which the packet is assigned by the classifier.

1 33. (Original) The router of claim 32 wherein the buffer subsystem discards a
2 given packet if the associated new weighted average depth for the free queue falls below
3 a minimum threshold associated with the class of service to which the packet is assigned.

1 34. (Original) The router of claim 33 wherein the buffer subsystem processor cal-
2 culates the probability of discard as $P_d = c - (m * A_{NEW})$ where c is an intercept and m is a
3 slope that is associated with a line that plots average free queue depth versus probability
4 of discard for the class of service to which the packet is assigned, and A_{NEW} is the new
5 weighted average depth of the free queue.

1 35. (Original) The router of claim 34 wherein the buffer subsystem processor cal-
2 culates the new weighted average depth of the free queue as $A_{NEW} = A_{CURRENT} + w(I -$
3 $A_{CURRENT})$ where w is a weighting factor, I represents the instantaneous depth of the free
4 queue and $A_{CURRENT}$ is the current weighted average depth of the free queue.

1 36. (Currently amended) The router of claim ~~35~~30 wherein the scheduler selects
2 from the buffer subsystem packets for transfer based on weighting factors associated with
3 the respective 2^n X classes of service.

1 37. (Original) A router for use in routing packets over a network, the router sup-
2 porting a plurality, X , of classes of service and including:

- 3 A. a plurality of input ports for receiving packets over the network;
4 B. a plurality of output ports for transferring packets over the network;
5 C. a multiple storage location buffer for retaining packets to be transferred
6 through the output ports;
7 D. a buffer subsystem for retaining the packets in class of service per output port
8 queues based on probabilities of discard associated with $X*Y$ classes of service, where *
9 represents multiplication; and
10 E. a scheduler for transferring the packets from the buffer subsystem through each
11 of the output ports based on the X classes of service that the router supports.

- 1 38. (Currently amended) The router of claim 37 further including a classifier for:
2 i. assigning packets received by the input ports to $X*Y$ classes of service,
3 ii. associating the packets with the ~~$X*Y$~~ X classes of service that are supported by
4 the router, and
5 iii. assigning to the packet one of ~~$X*Y$~~ Y associated levels of priority, wherein
6 each level of priority is associated with a different probability of packet loss.

- 1 39. (Currently amended) The router of claim ~~38~~37 wherein the buffer subsystem
2 includes a processor that determines
3 i. a new weighted average queue depth for a free queue that links available buffer
4 storage locations, and
5 ii. a probability of discard for a given packet if the new weighted average free
6 queue depth falls below a predetermined maximum threshold associated with the class of
7 service to which the packet is assigned.

- 1 40. (Original) The router of claim 39 wherein the buffer subsystem processor cal-
2 culates the probability of discard as $P_d = c - (m * A_{NEW})$ where c is an intercept and m is a

3 slope that are associated with a line that plots average free queue depth versus probability
4 of discard for the class of service to which the packet is assigned, and A_{NEW} is the new
5 weighted average depth of the free queue.

1 41. (Original) The router of claim 40 wherein the buffer subsystem processor cal-
2 culates the new depth of the weighted average free queue as $A_{NEW} = A_{CURRENT} + w(I -$
3 $A_{CURRENT})$ where w is a weighting factor, I represents the instantaneous depth of the free
4 queue and $A_{CURRENT}$ is the current weighted average depth of the free queue.

1 42. (Currently amended) The router of claim ~~41~~ 40 wherein the buffer subsystem
2 discards a given packet if the new weighted average free queue depth falls below a mini-
3 mum threshold associated with the class of service to which the packet is assigned.

1 43. (Currently amended) The router of claim ~~41~~ 40 wherein the buffer subsystem
2 retains a given packet if the new weighted average free queue depth is above a maximum
3 threshold associated with the class of service to which the packet is assigned.

1 44. (Currently amended) The router of claim 37 wherein the scheduler selects pack-
2 ets for transfer through each output port based on weighting factors associated with the
3 respective 2^n X classes of service.

Please add the following new claims 45 et seq.

1 45. (New) An apparatus for routing packets through a router that supports a plu-
2 rality, X, of classes of service, the apparatus comprising:
3 means for receiving packets through one or more input ports and assigning the
4 packets to $X*Y$ classes of service, where * represents multiplication;
5 means for retaining packets based on probabilities of discard associated with the
6 $X*Y$ classes of service in a multiple storage location buffer that links available storage
7 locations to a free queue; and
8 means for transferring the packets through one or more output ports based on
9 the X classes of service.

1 46. (New) The apparatus of claim 45, further including:
2 means for associating packets assigned to the $X*Y$ classes of service with the X
3 classes of service supported by the apparatus; and
4 means for assigning to the respective packets one of Y associated levels of pri-
5 ority, each level of priority being associated with a different probability of packet loss.

1 47. (New) The apparatus of claim 46, further comprising:
2 means for determining a new weighted average depth for the free queue; and
3 means for determining a probability of discard for a given packet if the new
4 weighted average free queue depth falls below a predetermined maximum threshold as-
5 sociated with the class of service to which the packet is assigned.

1 48. (New) The apparatus of claim 47, wherein the means for retaining packets fur-
2 ther comprises:

3 means for discarding a given packet if the new weighted average free queue
4 depth is less than a minimum threshold associated with the class of service to which the
5 packet is assigned.

1 49. (New) The apparatus of claim 47, wherein the means for retaining packets fur-
2 ther comprises:

3 means for retaining a given packet if the new weighted average free queue depth
4 is greater than a maximum threshold associated with the class of service to which the
5 packet is assigned.

1 50. (New) A computer-readable media, comprising:

2 instructions for execution in a processor for the practice of a method, said method
3 having the steps,

4 receiving packets through one or more input ports and assigning the
5 packets to $X*Y$ classes of service, where $*$ represents multiplication;

6 retaining packets based on probabilities of discard associated with the
7 $X*Y$ classes of service in a multiple storage location buffer that links available
8 storage locations to a free queue; and

9 transferring the packets through one or more output ports based on the X
10 classes of service.

1 51. (New) The computer-readable media of claim 50, wherein the method further
2 comprises the steps of:

3 associating packets assigned to the X*Y classes of service with the X
4 classes of service supported by the apparatus; and
5 assigning to the respective packets one of Y associated levels of priority,
6 each level of priority being associated with a different probability of packet loss.

1 52. (New) The computer-readable media of claim 51, wherein the method further
2 comprises the steps of:

3 determining a new weighted average depth for the free queue; and
4 determining a probability of discard for a given packet if the new
5 weighted average free queue depth falls below a predetermined maximum
6 threshold associated with the class of service to which the packet is assigned.

1 53. (New) The computer-readable media of claim 52, wherein the method further
2 comprises the step of:

3 discarding a given packet if the new weighted average free queue depth
4 is less than a minimum threshold associated with the class of service to which
5 the packet is assigned.

1 54. (New) The computer-readable media of claim 52, wherein the method further
2 comprises the step of:

3 retaining a given packet if the new weighted average free queue depth is
4 greater than a maximum threshold associated with the class of service to which
5 the packet is assigned.

1 55. (New) Electromagnetic signals propagating on a computer network, comprising:

2 instructions for execution on a processor for the practice of a method, said method
3 having the steps,
4 receiving packets through one or more input ports and assigning the
5 packets to $X*Y$ classes of service, where $*$ represents multiplication;
6 retaining packets based on probabilities of discard associated with the
7 $X*Y$ classes of service in a multiple storage location buffer that links available
8 storage locations to a free queue; and
9 transferring the packets through one or more output ports based on the X
10 classes of service.

1 56. (New) The electromagnetic signals of claim 55, wherein the method further
2 comprises the steps of:
3 associating packets assigned to the $X*Y$ classes of service with the X
4 classes of service supported by the apparatus; and
5 assigning to the respective packets one of Y associated levels of priority,
6 each level of priority being associated with a different probability of packet loss.

1 57. (New) The electromagnetic signals of claim 56, wherein the method further
2 comprises the steps of:
3 determining a new weighted average depth for the free queue; and
4 determining a probability of discard for a given packet if the new
5 weighted average free queue depth falls below a predetermined maximum
6 threshold associated with the class of service to which the packet is assigned.

1 58. (New) The electromagnetic signals of claim 57, wherein the method further
2 comprises the step of:

3 discarding a given packet if the new weighted average free queue depth
4 is less than a minimum threshold associated with the class of service to which
5 the packet is assigned.

1 59. (New) The electromagnetic signals of claim 57, wherein the method further
2 comprises the step of:

3 retaining a given packet if the new weighted average free queue depth is
4 greater than a maximum threshold associated with the class of service to which
5 the packet is assigned.